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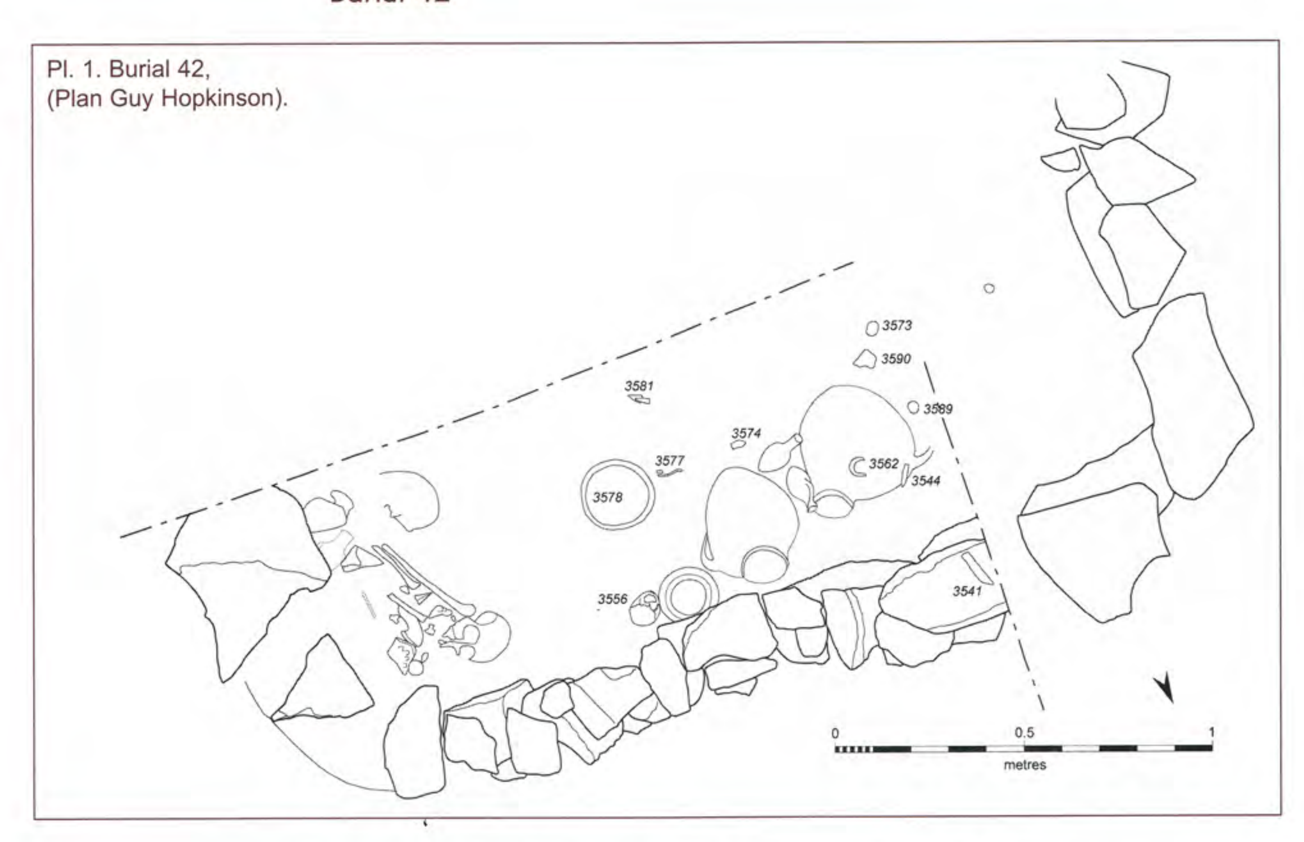
BRONZE ARTIFACTS FROM BURIAL 42 AT SIDON

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Weaponry at Sidon has mainly been found in constructed graves. These are the richest graves on site, their high status corroborated by their labour intensive construction [1] and the fact that they usually contain the remains of only a single individual. Burial 42 [2], first discovered in 2005, is the first constructed grave in which more than one individual was found. This article was originally submitted for publication just before the 2007 season at Sidon (28 April - 24 June 2007). The 2007 excavation revealed that there were more remains belonging to burial 42. The focus of the article was therefore changed from a full publication of the burial to a closer examination of the bronze artifacts found in burial 42. These consist of a socketed javelin, two daggers, decorative discs inferred to be decorations for a belt and a torque.

Burial 42

Pl. 1. Burial 42, (Plan Guy Hopkinson).



Burial 42 is a grave of east-west orientation (pl. 1, fig. 1-1a) measuring 2.16 m long, 1.61 m wide and 80 cm deep. There were two oval slabs on floor of the grave, one at the eastern end measuring 64 cm x 39 cm x 8 cm and one at the western end measuring 77 cm x 30 cm x 10 cm. The grave was delimited along its northern side by a three-course wall made of

unworked roughly cut limestone nodules of irregular size. The northern wall maximum thickness was 36 cm and its minimum 24 cm at its eastern end. The inside facing of the wall had three courses, the outside only of two. The size of the stones varied from 25 cm x 19 cm x 9 cm to 20 cm x 15 cm x 10 cm. The western end of the grave was marked by a four-course wall made of large dressed limestone blocks, the largest measuring 58 cm x 42 cm x 9 cm. There was no wall at the east end of the grave only two unworked stones. The southern half of the tomb was excavated in 2007. No stone lining was revealed at the southern limit of the grave which was only indicated by two large unworked stones projecting from the eastern end and western end wall.

1-1a Burial 42 (photo Richard Mikulski).





Although a few disarticulated remains were recovered from the upper layers at the west end of the grave, most of the human bones were piled up in the east end. The soil where the majority of the human remains were found consisted of pure sand. In the upper levels of the grave there was a clay soil together with plaster fragments and occasional charcoal flecks. In 2007 the southern half of the grave was found to contain a large number of disarticulated human bones concentrated in at least three deposits.

The bones recovered from burial 42 in 2005 were identified by Alan Ogden from the Biological Anthropology Research Centre at the Department of Archaeological Sciences of Bradford University. The bones recovered at that time indicated that the grave contained at least 4 individuals, one mid-adult female, one large adult old male, one sub adult around 5 to 6 years, and one young adult. The bones excavated more recently still need to be analysed so it is possible that the estimate of the minimum number of individuals represented may increase.

One dagger (S/3541) (fig. 2, pl. 1&2) was found on top of the northern wall at its western end and a socketted javelin (S/3544) (fig. 3, pl. 2) was found at the western end inside the burial. Another dagger (S/3637) (fig. 4, pl. 2) was discovered inside the grave in the sand with the human remains at the eastern end. Five bronze discs (fig. 5-9, pl. 3) were scattered in the western part of the grave together with several fragments of a torque.

The south-west part of the burial revealed a thin layer of plaster below the level of the bronze discs. A layer of plaster is clearly visible in the east facing section at the western end of the grave. Remains of a layer of plaster were found at different levels in other parts of the grave. Four pots placed together were found in the north western corner of the grave and at least nine more were found in the grave during the 2007 excavations.

S/3544

S/3541

S/3637

Pl. 2. 0 5 cm

The bronze artifacts

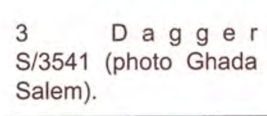


2 Javelin S/3544 (photo Ghada Salem).

Socketted javelin head S/3544 (fig. 2, pl. 1&2)

Overall length	: 86 mm.
Length of blade	: 43 mm.
Thickness of blade	: 3 mm.
Length of socket	: 35 mm.
Max. diameter of socket	: 13 mm.
Max. inner diameter of socket	: 11 mm.
Point	: sharp.

Well-defined midrib; very thin sharp blade; socket completely closed at top as cast, but very thin walled. The end of the socket was secured by a twine binding or a metal collar. A range of small javelin heads, Philip [3] types 6-10 are found in early second millennium contexts throughout the Levant, Mesopotamia, the Persian Gulf, Cappadocia and into the Nile Delta.



Dagger S/3541, (fig. 3, pl. 2) was found on the wall of the burial implying that disturbance has taken place.



3 Dagger S/3541 (photo Ghada Salem).

Overall length	: 112 mm.
Maximum breadth of blade	: 26 mm.
Maximum thickness of blade	: 3 mm.
Shape of blade	: tapering.
Point	: sharp.

This is a short narrow dagger belonging to Philip type 27 [4] similar to the one found in Sidon's burial 27 with a straight tapering blade and a flat section [5]. The butt is broken but closely related to Philip's type 36 [6] with the distinctive hafting method of one rivet in each shoulder and one in a short tang.

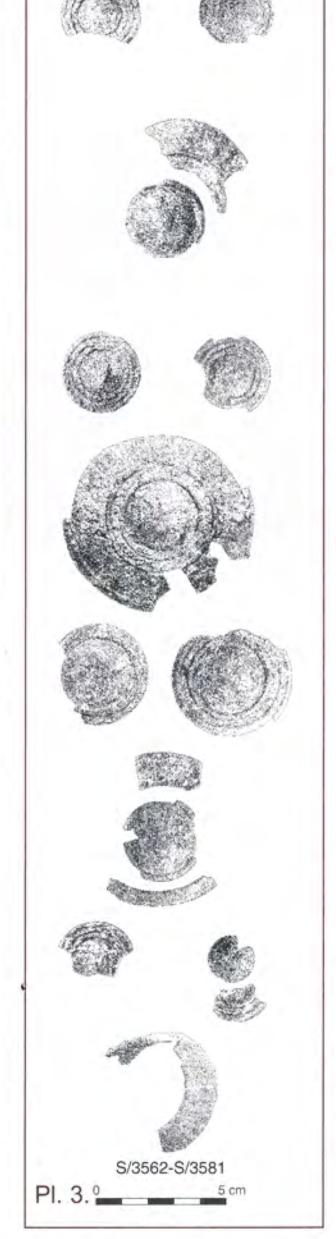
Dagger S/3637 (fig. 4, pl. 2)



4 Dagger S/3637 (photo Ghada Salem).

Overall length	: 183 mm.
Maximum breadth of blade	: 42 mm.
Maximum thickness of blade	: 3 mm.
Shape of blade	: tapering.
Point	: sharp.

A single long flat narrow-blade dagger with a trapezoidal butt slightly concave on one side. Three rivets are laid out in a triangular pattern, only two of which were found in place (18 mm long, 3 mm wide). The shoulders are biconical. This type of dagger belongs to Philip type 30 [7].



Pl. 3.



5-6 Discs with concentric circles from Sidon backed by a white material.

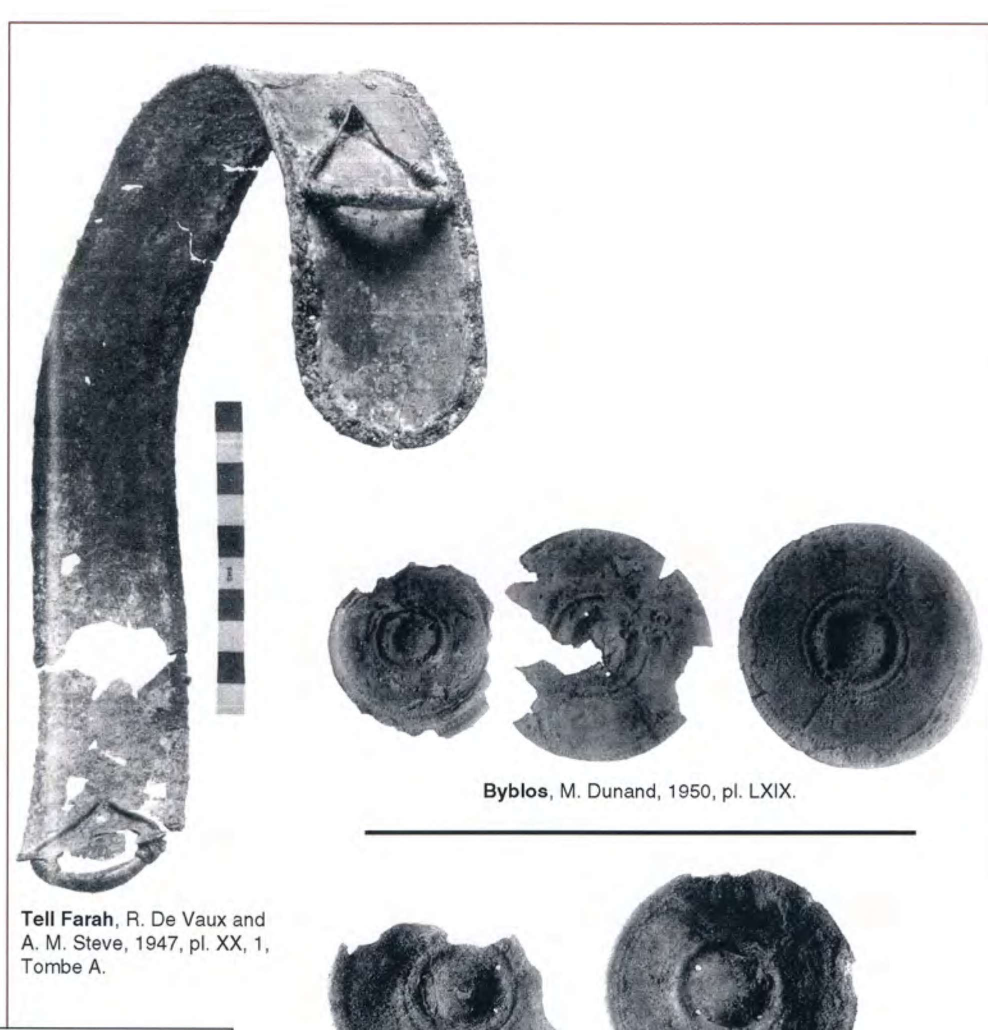
Belt S/3562-S/3581 (fig. 5-9, pl. 3)

Maximum diam. of discs	: 69 mm.
Maximum thickness of discs	: 10 mm.
Thickness of belt	: 1 mm.
Average diam. of discs	: 28 to 31 mm.

The discs consist of round metal shields with concentric circles. The similarity of these discs to those found at other sites makes it extremely likely that these were discs used to decorate belts. Belt discs were also found in Byblos (pl. 4). Burials equipped with belts are found in several tombs from Tell Daba'a, in Jericho and Tell Far'ah (N) (pl. 4-5).

The Sidon belt discs and the earliest examples from Tell Daba'a [8] are unusual in being the only belt discs not showing any perforations on the border of the discs to facilitate the metal being sewn onto the leather or other belt material.

There is no clear evidence of how the Sidon belt discs may have been affixed to a substrate material. The discs are all backed by a slightly powdery white mate-



Byblos, M. Dunand, 1950, pl. LXIX.

Tell Farah, R. De Vaux and A. M. Steve, 1947, pl. XX, 1, Tombe A.

7-8 Disc with concentric circles from Sidon backed by a white material (photo Ghada Salem).



Byblos, M. Dunand, 1950, pl. LVII.

Pl. 4.

rial (fig. 6, 8, 9) which supports the relatively thin metal. This might have been a plaster or a putty which could have served to hold the discs in place on a corpse. It seems unlikely, however, that such materials would have provided enough adhesion to secure the discs to a standing individual without some other means of attachment. Oversewing of the rims of the discs or overlapping them with rims of leather might be possible means of attachment but this is purely speculative. For the present there the possibilities are that the discs were only for burial decoration or that there was a means of attachment to a substrate that has left no trace.

Tell el Daba'a, M. Bietak, 1981, p. 241, fig. 4, Tomb m/15 n° 9, str. G.

Tell el Daba'a, M. Bietak, 1984, p. 342 - MBII A/B.

Tell el Daba'a, R. Schiestl, 2002, fig. 3, 4, p. 334, Tomb 8, str. d/2.

Jericho, K. M. Kenyon, 1960, fig. 117, 4, p. 312, Tomb J3.

Pl. 5.

9 Fragments of belt with white plaster or putty at the back (photo Ghada Salem).



10 Scanning electron micrograph of the white material backing bronze disc fragment S/ 3573. The image shows a variety of nanofossils present in the material.

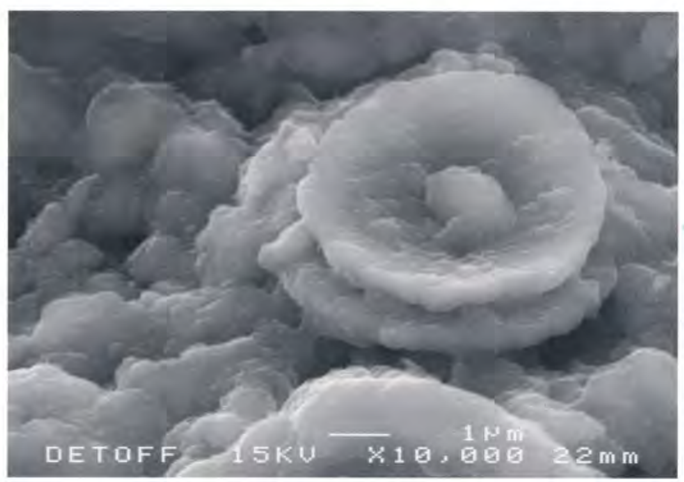
The white material backing the discs has been examined by scanning electron microscopy with energy dispersive X-ray spectroscopy. This technique provides both a magnified view of the microstructure of the material and elemental analysis of any chosen area.

Some parts of the white material that were in contact with the bronze discs are stained green due to corrosion of the bronze discs. These areas showed the presence of high levels of copper and tin. This is consistent with the discs being made of a copper-tin bronze. The composition of the green stained areas (which vary widely in their copper:tin ratios) does not, however, serve to indicate the composition of the original bronze metal since the copper and tin become distributed differently during the corrosion process according to highly localized conditions.



11-12 Scanning electron micrographs at higher magnification showing structural detail of some of the

The white material itself has a composition which is variable but generally contains calcium as a major element with lesser amounts of silicon and aluminium. Very minor amounts of magnesium, potassium and iron are common, and phosphorus, titanium and manganese occur in some areas analysed. The major constitutents (predominantly calcium with less silica and even less aluminium) are consis-



nanofossils present in the white material backing bronze disc fragment S/3573.

tent with an earth derived from a limestone (whence the calcium) that contains clay (whence the silicon and aluminium). Such materials are known geologically as marls and occur naturally in the Lebanon. They could also be made by man by mixing lime and a white clay.

The white material backing the bronze discs could have been mildly calcined (fired) to partly transform the calcium carbonate into calcium oxide so that the resulting heated powder could be mixed with water and used as a plaster backing to support the bronze discs. It is clear that any such calcination cannot have been strong as nanofossils survive in the white material (see below) and these would have been destroyed by thorough calcination.

Alternatively, it is possible that the white earth backing to the bronze discs was not heated but mixed with some organic material to make a substance similar to the putty commonly used to fix modern window glass into window frames. Further understanding of the original state of the white backing of the bronze discs and how they were originally mounted must however await further research.

Study of the microstructure of the white earth may in future yield further indications of its origins. Preliminary investigations have shown the presence of calcareous nanofossils, some examples of which are shown in fig. 10-12). Examination of one of the fragments of white material has identified nanofossils dating from the Cretaceous period (pers. comm., P. Bown, 2007)

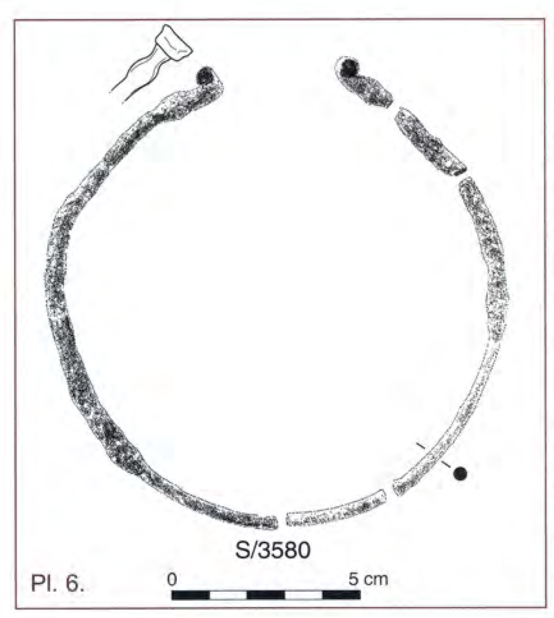
Torque S/3580/3577 (fig. 13, pl. 6)

Diameter : 110 x 120 mm.
Thickness : 3 mm.

13 Torque S/3580/3577.



Torque necklaces worn around the neck with a curved ending at either side are common at Ugarit in the Middle Bronze Age [9]. More then fifty bronze torques were found in Byblos in the *dépôt de fondation* [10] and silver torques were found in the *Temple aux Obélisques* [11]. Bracelets very similar to the Sidon torque were found in the favissa F. 5238 at Ebla [12].



Pl. 6.

The significance of the Sidon material in terms of context and grouping

Daggers are the most common weapon in the southern Levant in MB II [13] but were only found in Sidon in burials 13 and 27 that share in common the presence of silver jewellery [14]. In burial 27 the dagger was found in combination with the duckbill axe [15]. Axes and spears were particularly favoured [16] at Sidon.

In terms of spatial position in burial 42, the bronze artifacts have been affected by the disturbance inside the burial as one dagger was found on top of the wall and another was found inside the grave in the sand with the human remains pushed to one end of the grave. Burial 42 also contained the belt of a warrior, although the more common combination of bronze belt and duckbill axe was not found in this grave [17]. The enigma of how the bronze belt discs were mounted is worthy of further consideration. The rarity of javelins/arrowheads has been underlined by Philip [18]. The Sidon excavation has so far yielded two examples, one of which was found in burial 42 (see above) and the other deposited in the burial of a 13 year-old juvenile. The torque is probably a Syrian component, appearing particularly in Ras Shamra in warrior burials described by Schaeffer as those of "*les porteurs de torques*".

A better understanding of the dating of burial 42 and of the number of individuals in the interred in the grave must await further study of the material excavated in 2007.

CONSERVATION OF OBJECTS: ISABELLE SKAF.
DRAWINGS AND SCANNING: RAMY YASSINE.

NOTES

1 C. Doumet-Serhal, 2004 a, p. 149-151.
2 C. Doumet-Serhal, 2004 b, p. 54.
3 G. Philip, 1989, p. 88, 205.
4 G. Philip, 1989, p. 456.
5 C. Doumet-Serhal, 2004, p. 27.
6 G. Philip, 1989, p. 486.
7 G. Philip, 1989, p. 460.
8 R. Schiestl, 2002, p. 332.
9 C. F. A. Schaeffer, 1949, fig. 22, p. 88; fig. 47, p. 110, the "*porteurs de torques*" associated to the Ugarit Moyen I, p. 55.
10 M. Dunand, 1939, p. 271, pl. XCIII, 3915.
11 M. Dunand, 1954, pl. LXXXII, 18351 and pl. CXXXIX, 17695, 17696.
12 N. Marchetti and L. Nigro, 1999, p. 274-275, fig. 12.
13 G. Philip, 1989, p. 151-152, p. 169..."the preference for daggers in the south Levant as opposed to the north.
14 C. Doumet-Serhal, 2007, p. 39.
15 E. D. Oren, 1971, p. 131, mentions the axe-dagger-spear combination as the "standard arsenal of a warrior".
16 C. Doumet-Serhal, 2004 c, p. 175.
17 R. Shiestl, 2002, p. 332.
18 G. Philip, 1989, p. 145.

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